



**BBG-003-1016012**

Seat No. \_\_\_\_\_

**B. Sc. (Sem. VI) (CBCS) Examination**

**July - 2021**

**BT-602 : Analytical Techniques in Biotechnology**

**Faculty Code : 003**

**Subject Code : 1016012**

Time :  $2\frac{1}{2}$  Hours]

[Total Marks : 70

**Instructions :** (1) Objective types of questions are compulsory.  
(2) Write any 5 questions out of 10 questions.

- 1 [A] Answer the following (One mark) **4**
- (1) \_\_\_\_\_ is the SI unit of light.
  - (2) \_\_\_\_\_ and \_\_\_\_\_ gave the laws of Radioactive decay.
  - (3) Atom consist of \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.
  - (4) \_\_\_\_\_ is based upon the ability of radioactive substance to expose the photographic film by ionizing it.
- [B] Answer the following (2 mark) **2**
- (1) Explain Atomic structure.
- [C] Answer the following (3 mark) **3**
- (1) Short note: Safety in the laboratory.
- [D] Answer the following (5 mark) **5**
- (1) Explain laws of Radioactivity.
- 2 [A] Answer the following (One mark) **4**
- (1) \_\_\_\_\_ is a type of a particle detector that measures ionizing radiation.
  - (2) \_\_\_\_\_ is an image on an x-ray film produced by the pattern of decay emissions from a distribution of a radioactive substance.
  - (3) \_\_\_\_\_ is the SI unit for Radioactivity.
  - (4) Atomic nuclei are composed of two major components \_\_\_\_\_ and \_\_\_\_\_.

- [B] Answer the following (2 mark) 2  
 1. What is scintillation?
- [C] Answer the following (3 mark) 3  
 (1) Short note: Geiger Muller counter.
- [D] Answer the following (5 mark) 5  
 (1) Application of Radioactivity.
- 3 [A] Answer the following (One mark) 4  
 (1) Which is the first stage in 2D Electrophoresis?  
 (2) Who pioneer the work for the Electrophoresis?  
 (3) Full form of SDS-PAGE \_\_\_\_\_.  
 (4) Full farm of TEMED \_\_\_\_\_.
- [B] Answer the following (2 mark) 2  
 (1) Define: Electrophoresis.
- [C] Answer the following (3 mark) 3  
 (1) Explain basic principle of Electrophoresis.
- [D] Answer the following (5 mark) 5  
 (1) Explain SDS PAGE.
- 4 [A] Answer the following (One mark) 4  
 (1) Full form of IEF \_\_\_\_\_.  
 (2) Full form of 2D PAGE \_\_\_\_\_.  
 (3) Which tracking dye is used in PAGE?  
 (4) What is the angle of tube in fixed angle rotors?
- [B] Answer the following (2 mark) 2  
 (1) What is Isoelectric point?
- [C] Answer the following (3 mark) 3  
 (1) Explain Agarose electrophoresis.
- [D] Answer the following (5 mark) 5  
 (1) Explain Basic principle of sedimentation.
- 5 [A] Answer the following (One mark) 4  
 (1) Light have corpuscular nature. TRUE/FALSE.  
 (2) What will be the T-value if the substance completely absorbs the light?  
 (3) Radio waves are a type of Electromagnetic radiation with wavelengths in the Electromagnetic spectrum longer than infrared light. TRUE/FALSE.  
 (4) What is the wavelength associated with UV region in nm?

- [B] Answer the following (2 mark) 2  
 (1) State Lamberts Law.
- [C] Answer the following (3 mark) 3  
 (1) Explain Interaction of Electromagnetic radiation with matter.
- [D] Answer the following (5 mark) 5  
 (1) Describe Atomic absorption and Emission Spectroscopy.
- 6 [A] Answer the following (One mark) 4  
 (1) In  $T=I/I_0$  What is T?  
 (2) In  $T=I/I_0$  What is I?  
 (3) \_\_\_\_\_ is a research technique which exploits the magnetic properties of the atomic nuclei.  
 (4) Electromagnetic radiation is composed of \_\_\_\_\_ and \_\_\_\_\_ vector.
- [B] Answer the following (2 mark) 2  
 (1) State Beers law.
- [C] Answer the following (3 mark) 3  
 (1) Write the principle and application of UV visible spectroscopy.
- [D] Answer the following (5 mark) 5  
 (1) Brief Overview of NMR and its application.
- 7 [A] Answer the following (One mark) 4  
 (1) Full form of HPLC \_\_\_\_\_.  
 (2) What is  $K_d$ ?  
 (3) Full form of FPLC \_\_\_\_\_.  
 (4) Full form of TLC \_\_\_\_\_.  
 [B] Answer the following (2 mark) 2  
 (1) Define: Chromatogram.  
 [C] Answer the following (3 mark) 3  
 (1) Explain Ionic exchangers.  
 [D] Answer the following (5 mark) 5  
 (1) Explain GLC.
- 8 [A] Answer the following (One mark) 4  
 (1) Full form of GC \_\_\_\_\_.  
 (2) Full form of GLC \_\_\_\_\_.  
 (3) \_\_\_\_\_ is the stationary phase in paper chromatography if partition is the principle.  
 (4) Full form of UPLC \_\_\_\_\_.

- [B] Answer the following (2 mark) 2  
 (1) Name the different types of column used in HPLC.
- [C] Answer the following (3 mark) 3  
 (1) Explain the basic principle of affinity chromatography.
- [D] Answer the following (5 mark) 5  
 (1) Explain HPLC.
- 9** [A] Answer the following (One mark) 4  
 (1) Biosensor = \_\_\_\_\_ + Transducer.  
 (2) Thermometer is the example of physical biosensor.  
 TRUE/FALSE.  
 (3) Full form of IPR \_\_\_\_\_.  
 (4) \_\_\_\_\_ is a type of IPR which consist of recognizable sign, design or expression identifying products of a particular source from those of others.
- [B] Answer the following (2 mark) 2  
 (1) Define: Biosensor.
- [C] Answer the following (3 mark) 3  
 (1) Explain Copyright.
- [D] Answer the following (5 mark) 5  
 (1) Write the applications of Biosensor.
- 10** [A] Answer the following (One mark) 4  
 (1) A Ph meter is a chemical sensor. TRUE/FALSE.  
 (2) \_\_\_\_\_ biosensors function by the production of a current when a potential is applied between two electrodes.  
 (3) In India, the patent lasts for \_\_\_\_\_ years.  
 (4) \_\_\_\_\_ is the exclusive legal right, given to the inventor to print, publish, film, record literary musical or artistic material.
- [B] Answer the following (2 mark) 2  
 (1) Define: Nanotechnology.
- [C] Answer the following (3 mark) 3  
 (1) Explain approaches of Nanotechnology.
- [D] Answer the following (5 mark) 5  
 (1) Write the applications of Nanotachnology.